

aqueous solution of a water soluble, platinum nitrite salt or platinum ammine-nitrite salt; a water soluble rhodium nitrite salt or rhodium ammine-nitrite salt; ammonium hydroxide as a complexing agent; and hydrazine hydrate as a reducing agent. The claimed plating process utilizing the plating composition is autocatalytic and deposits high purity platinum-rhodium alloy coatings on substrates of virtually any material and of any geometrical shape. It is also essentially free of sulfur, phosphorus, chlorine and non-volatile components that cause impure plating, allowing for improved appearance and properties of the plated alloy, generates essentially no hazardous substances and avoids the accumulation of byproducts that degrade the plating bath, allowing for virtually unlimited replenishment of the bath.

There are several significant differences between the present invention and the disclosure of Torikai, et al. The examiner is correct that Torikai, et al discloses an electroless plating bath for the deposition of rhodium and rhodium alloys.

In the embodiment closest to the present invention, the Torikai, et al bath comprises a rhodium salt having the formula $[\text{Rh}(\text{NH}_3)_6]\text{X}_3$, wherein X is a halogen, NO_2 , etc., a hydrazine reducer, *a hydroxyl amine salt*, and optionally a platinum salt. Please notice that in all instances, the Torikai, et al composition *must* include a hydroxyl amine. It is recognized that Torikai, et al may also include "ammonia water", i.e. ammonium hydroxide, however, this is *in addition to and not instead of* a hydroxyl amine. Such hydroxy amine is not disclosed in the present application. As the examiner appreciates, Torikai, et al does not teach a platinum nitrite or platinum ammine nitrite salt. The examiner has pointed to Torikai's example 4 to show the deposition of a rhodium-platinum alloy, however, this example is irrelevant since both platinum chloride and rhodium chloride, not nitrites, are used.

The Examiner has applied Chang et al. to show the use of platinum amine-nitrite salt. Chang et al. disclose a platinum electroless plating bath, wherein the bath comprises a solution of platinum diamine dinitrite, hydrazine hydrate and ammonium hydroxide. It is recognized that Chang et al. has nothing whatsoever to do with plating rhodium or a rhodium containing alloy.

The Examiner has maintained that it would be obvious to one of skill in the art to incorporate the platinum diamine dinitrite salt disclosed in Chang et al. in the Tortikai, et al composition with the expectation of providing the desired electroless plating results, because such a platinum salt is conventionally used in electroless plating solutions with hydrazine hydrate and ammonium hydroxide. It is submitted that such a conclusion is inappropriate in view of the applied art. Appellants again assert that there is no motivation or suggestion in the art to combine the references in an effort to achieve the results of the claimed invention. Even if one were to hypothetically use the Chang, et al platinum salt in the Tortikai, et al composition, the result would still include a mandatory hydroxyl amine, which is not required as part of this invention.

The applied references does not teach or suggest combining a rhodium nitrite or amine-nitrite salt or with a platinum nitrite salt or platinum amine-nitrite salt to form a composition as in the present invention. It is apparent that the Examiner is using an *obvious to try standard of patentability* to hypothesize that one skilled in the art would find it obvious to form an electroless plating composition of the present invention based on a reading of the applied art. Further, it is respectfully submitted that the Examiner is employing an incorrect legal standard for patentability. The belief that one skilled in the art could form the claimed plating

bath does not suggest that one should form such a film to obtain the disclosed benefits. The examiner has only shown admittedly different salts and then concludes that the substitution would be obvious. A rejection on this basis is improper. The issue is not whether one skilled in the art could make such a substitution in light of Appellant's disclosure, but rather whether such a substitution is fairly *suggested by* the applied art. Such is absent. The prior art materials are not analogs, homologs or isomers and therefore the hypothetical substitution is unwarranted.

Appellants assert that while Chang et al. discloses the use of a platinum diamine dinitrite, there is no teaching or suggestion in the art to combine the platinum diamine dinitrite with a rhodium nitrite or ammine-nitrite salt to form an electroless plating bath for a platinum-rhodium alloy. More particularly, there is no teaching or suggestion to combine their a platinum diamine dinitrite with a rhodium nitrite salt or rhodium amine-nitrite salt in solution with hydrazine hydrate and ammonium hydroxide to form a composition suitable to plate a platinum-rhodium alloy onto a substrate. It is essential to recognize that not only is there nothing in the art to suggest a combination of these references to achieve the results of the claimed invention, but it is by no means conclusive that a combination of the teachings of these references would form a *compatible* solution having the stability of the presently claimed composition.

Because one does not know, based on a reading of the Torikai, et al. reference, if their composition would be compatible with a solution having a platinum salt disclosed by Chang et al., it cannot be said that the claimed invention is obvious. Rather, the Examiner seems to be stating that it would be obvious for one skilled in the art to try and see if the platinum salt of Chang et al. would work with the

solution of Rhoda et al. The appropriate test of obviousness is whether or not one skilled in the art would recognize upon a reading of the applied references that the platinum salt from Chang et al. would be appropriate for use in the solution of Torikai, et al to plate a platinum-rhodium alloy onto a substrate. To satisfy this test, it must be shown that there is a teaching or suggestion in the art to combine the references. Such motivation or suggestion is not present in either of the references. Requiring one skilled in the art to conduct experimentation to try and see if a particular platinum salt would be compatible with the solution of Torikai, et al., *including mandatory hydroxyl amine*, would place an undue burden on the person, which is indicative of non-obviousness. In order to reach the present invention, not only would there need to be a suggestion to substitute the Chang platinum salt into the Torikai, et al composition, but there must also be a suggestion that one must thereafter eliminate the hydroxyl amine. There is not such suggestion and the examiner has not provided a reason for eliminating a hydroxyl amine from the hypothetical combination.

The claimed plating composition is more stable than prior art solutions, generates essentially no hazardous substances and the absence of non-volatile components avoids the accumulation of byproducts that degrade the plating bath, allowing for virtually unlimited replenishment of the bath, and is essentially free of sulfur, phosphorus, chlorine and non-volatile components that cause impure plating, allowing for improved appearance and properties of the plated alloy. Moreover, the composition of the plating bath allows metallic rhodium and platinum to be precipitated from the plating bath by boiling without undesirable contaminants. It is therefore submitted that the rejection should be withdrawn.

Claim 22 stands rejected under 35 U.S.C. 103(a) over Torikai, et al. and Chang et al. as applied above, and further in view of Ishihara et al. It is respectfully asserted that this ground of rejection is incorrect and should be withdrawn. Torikai et al. and Chang et al. have been discussed above. Ishihara et al. discloses a conductive film circuit formed on an insulator substrate or semiconductor substrate whereby a metal or metal alloy, including a platinum-rhodium, alloy is deposited onto the substrate by coating or sputtering and then subsequently etched. It is respectfully submitted that this reference is not applicable to the present invention in that it does not relate to electroless plating of a substrate. The reference does not teach or suggest that semiconductor substrates are suitable for electroless plating techniques, nor electroless plating techniques as described by the present invention. Absent such a teaching or suggestion, the claim cannot be obvious in view of the applied references. Further in view of the differences between the claimed invention and the applied art discussed above, it is asserted that this reference is irrelevant to the patentability of the invention. For these reasons it is requested that the rejection be withdrawn.

With regard to the process claims, the invention is further removed from the combination of Torikai, et al and Chang, et al. In addition to the differences discussed above, when a *rhodium alloy*, as opposed to rhodium alone, is to be plated, such must be done at high temperatures and pressures. The present invention has no such requirement. Please note on page 3, last two paragraphs of Torkai, et al, that their reaction requires use of an autoclave at a pressure of 10-30 Kg/cm² and temperatures in the range of 120 °C to 160 °C as opposed to the 20°C to about 98°C in the present claim 14. While Torikai's page 7 also reveals temperatures of 50-90 °C, this is only for rhodium alone, not alloys. For these reasons, all claims are urged to be patentable over the cited references,

and the rejections under 35 U.S.C. 103 should be withdrawn.

The undersigned respectfully requests re-examination of this application and believes it is now in condition for allowance. Such action is requested. If the examiner believes there is any matter which prevents allowance of the present application, it is requested that the undersigned be contacted to arrange for an interview which may expedite prosecution.

OFFICIAL

Respectfully Submitted,

✓ Richard S. Roberts
Attorney for Appellants
Registration No. 27,941
P.O. Box 484
Princeton, New Jersey 08542
Tel: 609-921-3500
FAX: 609-921-9535
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I hereby certify that this paper is being facsimile transmitted to the United States Patent and Trademark Office (FAX No. 703-872-9310) on April 24, 2003.

Richard S. Roberts